

GB 1460864  
JAN 1977

GROUP 281  
CLASS 285  
RECORDED

ICATION

1460864

1 460 864

- (21) Application No. 11308/74 (22) Filed 14 March 1974  
(23) Complete Specification filed 13 June 1975  
(44) Complete Specification published 6 Jan. 1977  
(51) INT CL<sup>7</sup> F16L 19/00  
(52) Index at acceptance F2G 25A 2B  
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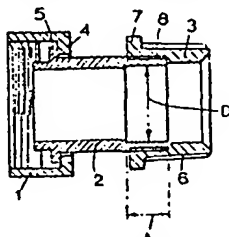
GROUP 281  
CLASS 285  
RECORDED



(54) IMPROVEMENTS IN PIPE UNIONS

(71) PANY LII  
Delta Road  
hereby dec  
5 pray that a  
the method  
be particu  
following s  
This inve  
10 providing  
first and se  
which the  
more partic  
comprising  
15 flange and  
member h  
adjacent to  
being adap  
with the fir  
20 of the tub  
member by  
co-operation  
between the  
flanges of  
the nut and  
the tubular  
member on  
tightening  
of the union  
25 nut onto  
the first  
member, and  
a further  
metallic  
member  
secured to  
the other  
end of the  
tubular  
member and  
adapted to  
screw-  
threadedly  
engage with  
the second  
screw-  
threaded  
member, the  
union nut  
being held  
captive on  
the tubular  
30 member by  
the flange  
on the  
tubular  
member and  
said further  
member which  
has a  
sufficiently  
large  
transverse  
dimension  
to prevent  
passage of  
the union  
nut over  
said  
further  
member.  
35 Unions of  
this kind  
have been  
used for  
connecting  
gas  
appliances  
together,  
for  
connecting  
a meter  
service  
governor  
to a  
meter for  
example.  
It is known  
to connect  
the tubular  
member  
40 to said  
further  
member  
after  
assembly  
of the  
union  
nut onto  
the  
tubular  
member  
by  
screwing  
and  
brazing  
the  
tubular  
member  
to  
said  
further  
member.  
This is,  
however,  
an  
expensive  
operation,  
45 requires  
testing  
of the  
seal  
between  
the  
two  
members,  
and has a  
high  
reject  
rate.  
Moreover  
the seal  
between  
the two  
members  
may be  
broken  
when  
the  
union  
is

SPEY Q67 \*A1007Y/01 \*GB 1460-864  
Mfg. pipe union for incompatible threaded members - by threading  
tubular member, fitting union nut, screwing end member on and  
deforming threaded joint  
SPERRY & CO LTD 14.03.74-GB-011308  
(06.01.77) F16L-19  
A pipe union for two incompatible threaded members is  
formed from a stamped union nut (1) held captive on a sta-  
mped and machined tubular member (2) secured to a forged member (3).  
The nut is tapped and the member (3) has an external tapered thread (6).  
The union is formed by first forming a thread on one end of the tubular member (2) and then passing the nut over this end. The member (3) is then screwed onto the tubular member and a ball plunger or roller burnishing tool inserted to expand the joint to bind the threads of the joint together to form a gas tight seal. 13.6.75 (4pp)



tion of the 50  
method of  
and set forth  
end of the  
er member  
threads, 55  
the tubular  
other end,  
er to said  
permanently  
int between 60  
aid further  
radially.  
the further  
a drop of a  
applied to 65  
per at said  
other end is  
formed with  
an external  
screw thread  
for engage-  
ment with a  
co-operating  
internal  
screw thread  
formed in  
said further  
member.  
Usually the  
further  
member will  
be formed  
with an  
external  
radially  
extending  
polygonal  
flange for  
engagement  
by a  
spanner  
when the  
further  
member is  
75 tightened  
in use to  
the second  
member. It  
is this  
polygonal  
flange which  
would  
prevent  
assembly  
of the union  
nut onto the  
tubular  
member if  
the tubular  
member were  
to be made  
integral with  
the further  
member. 80  
The tubular  
member and  
the further  
member may  
be made of  
any suitable  
metal but  
preferably  
they are  
made of  
brass.  
The expansion  
of the joint  
between the  
tubular  
member and  
the further  
member is  
conveniently  
performed  
by cold  
forming  
with a ball  
plunger or  
roller  
burnishing  
tool.  
The invention  
will now be  
further  
described,  
by way of  
example only,  
with  
reference to  
the  
accompanying  
drawing  
which is an  
axial cross  
section of a  
completed  
brass union  
adapted to  
secure an  
externally  
screw-  
threaded  
first  
member to  
an internally  
screw-  
threaded  
second  
member to  
provide  
fluid  
communication  
therebetween. 95

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The union comprises a stamped union nut 1 held captive on a stamped and machined tubular member 2 secured to a further member 3 which is a forging.

5 The union nut 1 is internally screw-threaded for engagement with external screw threads on a first member, not shown, and is provided with an internal radial flange 4 for engagement with an external radial flange 5 which is an integral part of one end of the tubular member 2. When the union nut 1 is screwed in use onto the first member the tubular member 2 is drawn towards the first member by the engagement between the flanges 4 and 5.

15 The further member 3 is formed with an external tapered screw thread 6 for engagement with an internal co-operating screw thread of a second member, not shown, and is provided with an integral polygonal radial flange 7 for engagement by a spanner during tightening in use of the further member 7 to the second member.

20 Initially the other end 8 of the tubular member 3 comprises a plain sleeve. Prior to assembly of the union nut 1 onto the sleeve the exterior of said other end 8 is formed with a plain external screw thread for engagement with a complementary screw thread formed internally of the further member 3. The union nut is then assembled onto the tubular member 2 by passing it over said other end 8 of the tubular member. The tubular member and the further member are then screwed together and a ball plunger or roller burnishing tool is inserted into the joint between the members by passing it through the further member 3, and the joint between the members is expanded radially over the distance A by cold forming to increase the internal diameter D of the joint and to bind the screw threads of the joint together to form a gas-tight seal between the tubular member 2 and the further member 3.

45 In one example the initial diameter D is 0.875 inches and a plunging tool of 0.925" diameter is used. The diameter D is thus increased by slightly more than 4% of its initial value.

50 In order to increase the break-loose torque of the joint between the members 2 and 3 a drop of a screw-thread locking material such as that sold under the Registered Trade Mark 'LOCTITE' STÜDLOCK (OR GRADE 75) is applied to the middle part of one of the screw threads before the members 2 and 3 are screwed together.

#### WHAT WE CLAIM IS:—

1. A method of manufacturing a pipe union of the kind set forth comprising forming said other end of the tubular member and said further member with complementary screw threads, assembling the union nut onto the tubular member by passing it over said other end of the tubular members, screwing said tubular member to said further member, and then permanently deforming the screw-threaded joint between said tubular member and said further member by expanding the joint radially.

2. The method according to claim 1 in which the tubular member is formed with its screw thread prior to assembling the union nut onto the tubular member.

3. The method according to claim 1 or claim 2 in which prior to screwing the tubular member to said further member screw-thread locking material is applied to at least one of the co-operating screw threads.

4. The method according to any of the preceding claims in which the co-operating screw threads comprise an external screw thread formed on the tubular member and an internal screw thread formed on said further member.

5. The method according to any of the preceding claims in which the expansion of the joint is performed by cold forming.

6. The method according to claim 5 in which the joint between the tubular member is expanded by insertion of a ball plunger.

7. The method according to claim 5 in which the joint between the tubular member is expanded by a roller burnishing tool.

8. The method according to any of the preceding claims in which the tubular member and said further member are of brass.

9. The method according to any of the preceding claims in which the internal diameter of the joint between the tubular member and said further member is increased by more than four per cent of the initial diameter.

10. The method according to claim 1 and substantially as described with reference to the accompanying drawing.

11. A pipe union of the kind set forth produced by the method according to any of the preceding claims.

12. A pipe union of the kind set forth manufactured according to the method of claim 10 and substantially as described with reference to the accompanying drawing.

The union comprises a stamped union nut 1 held captive on a stamped and machined tubular member 2 secured to a further member 3 which is a forging.

5 The union nut 1 is internally screw-threaded for engagement with external screw threads on a first member, not shown, and is provided with an internal radial flange 4 for engagement with an external radial flange 5 which is an integral part of one end of the tubular member 2. When the union nut 1 is screwed in use onto the first member the tubular member 2 is drawn towards the first member by the engagement between the flanges 4 and 5.

15 The further member 3 is formed with an external tapered screw thread 6 for engagement with an internal co-operating screw thread of a second member, not shown, and is provided with an integral polygonal radial flange 7 for engagement by a spanner during tightening in use of the further member 7 to the second member.

20 Initially the other end 8 of the tubular member 3 comprises a plain sleeve. Prior to assembly of the union nut 1 onto the sleeve the exterior of said other end 8 is formed with a plain external screw thread for engagement with a complementary screw thread formed internally of the further member 3. The union nut is then assembled onto the tubular member 2 by passing it over said other end 8 of the tubular member. The tubular member and the further member are then screwed together and a ball plunger or roller burnishing tool is inserted into the joint between the members by passing it through the further member 3, and the joint between the members is expanded radially over the distance A by cold forming to increase the internal diameter D of the joint and to bind the screw threads of the joint together to form a gas-tight seal between the tubular member 2 and the further member 3.

45 In one example the initial diameter D is 0.875 inches and a plunging tool of 0.925 inch diameter is used. The diameter D is thus increased by slightly more than 4% of its initial value.

50 In order to increase the break-loose torque of the joint between the members 2 and 3 a drop of a screw-thread locking material such as that sold under the Registered Trade Mark 'LOCTITE' STULOCK (OR GRADE 75) is applied to the middle part of one of the screw threads before the members 2 and 3 are screwed together.

#### WHAT WE CLAIM IS:—

60 1. A method of manufacturing a pipe union of the kind set forth comprising forming said other end of the tubular member and said further member with complementary screw threads, assembling the union nut onto the tubular member by passing it over said other end of the tubular members, screwing said tubular member to said further member, and then permanently deforming the screw-threaded joint between said tubular member and said further member by expanding the joint radially.

70 2. The method according to claim 1 in which the tubular member is formed with its screw thread prior to assembling the union nut onto the tubular member.

3. The method according to claim 1 or claim 2 in which prior to screwing the tubular member to said further member screw-thread locking material is applied to at least one of the co-operating screw threads.

4. The method according to any of the preceding claims in which the co-operating screw threads comprise an external screw thread formed on the tubular member and an internal screw thread formed on said further member.

5. The method according to any of the preceding claims in which the expansion of the joint is performed by cold forming.

6. The method according to claim 5 in which the joint between the tubular member is expanded by insertion of a ball plunger.

7. The method according to claim 5 in which the joint between the tubular member is expanded by a roller burnishing tool.

8. The method according to any of the preceding claims in which the tubular member and said further member are of brass.

9. The method according to any of the preceding claims in which the internal diameter of the joint between the tubular member and said further member is increased by more than four per cent of the initial diameter.

10. The method according to claim 1 and substantially as described with reference to the accompanying drawing.

11. A pipe union of the kind set forth produced by the method according to any of the preceding claims.

12. A pipe union of the kind set forth manufactured according to the method of claim 10 and substantially as described with reference to the accompanying drawing.

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Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1977.  
Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from  
which copies may be obtained.

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